Remarks

Claim Amendments

Applicant includes the listing of claims as amended in the Preliminary Amendment dated June 22, 2004.

The claim dependencies are amended for claims 4, 8-14 and 16-21.

Claim 3 is amended so that it is now dependent upon Claim 1 as an alternative embodiment to Claim 1, eliminating the features already found in Claim 1. This is supported in the specification as filed.

Claim 2 is herein Cancelled without prejudice.

New Claims

New Claims 22 to 60 are added, these claims based on the originally filed Claims 1 to 21 as filed and amended herein; wherein new Claim 22 is also supported at, for example, paragraph [00016] of the specification as filed, as is new Claims 35 and 48.

No new matter is added, as the new claims are directed to varying embodiments as disclosed in the specification as filed.

Previously Filed Information Disclosure Statements

In the Action dated October 1, 2004, the Examiner did not include acknowledgments of three Supplemental IDSs filed each on March 5, 2004, May 10, 2004, and May 20, 2004. Copies of each of the IDSs, the non-US patent references and USPTO Reply Acknowledgments are attached for purposes of confirmation.

The Applicant requests that the Examiner include in the next action an acknowledgment that these have been considered.

New Information Disclosure Statements

The Applicant herein submits a Supplemental Information Disclosure Statement to the references cited below in the discussion, and as listed on the attached form 1449.

Section 112 Rejections, second paragraph

Claims 2 to 21 were rejected under 35 U.S.C. § 112, second paragraph as indefinite. The Applicant traverses this rejection, as the Claim 2 makes a valid comparison. However, given that this claim is directed to a distinct embodiment from that of Claims 1 and/or 3, the Applicant herein cancels Claim 2 without prejudice.

The Applicant requests that this rejection be withdrawn.

Section 102 Rejections

Claims 1 through 21 were rejected by the Examiner under 35 U.S.C. § 102(b) as anticipated by *Kuroda et al.* (US 4,414,369); *Nummilla-Pakerinen et al.* (WO publication; equiv.: US 6,562,905); and *Nowlin et al.* (US 5,539,076). In particular, the Examiner states that "the molecular weight, molecular weight distribution and gel content limitations are inherent" in the art. The Applicant traverses these rejections.

Anticipation of a claim can be found when a prior art reference discloses every limitation of the claimed invention, either explicitly or inherently.[1] The Examiner has not shown either in the current set of claims.

None of *Kuroda*, *Nummilla-Pakerinen* or *Nowlin* disclose the features of Claim 1 of "gel count" or "melt temperature" as is admitted by the Examiner Further, if inherency is relied upon, it is the Examiner's burden to show that the missing claim features are *necessarily* present.[2] The "melt temperature" is an measurable property of any polymer, depending on its flow and density properties as claimed and how it is

[1] Verdegaal Bros., Inc. v. Union Oil Co., 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir.), cert. denied, 484 U.S. 827 (1987).
[2] MPEP §§ 2112 and 2131.01 (Rev. 2 May 2004) (citing *In re Rijckaert*, 9 F.3d 1521, 1534 (Fed. Cir. 1993))

measured, described in detail in the specification for the current claims.[3] The Examiner has not shown that this or other features of Claim 1 (as well as the new claims) not found explicitly in the art, are inherent therein.

The Applicant requests that this rejection be withdrawn.

Section 103 Rejections

Claims 1 through 3 were rejected in the alternative by the Examiner under 35 U.S.C. § 103(a) as obvious over the same art as cited above, citing *In re Fessman*[4] and *In re Fitzgerald*.[5] Applicant traverses as (1) these cases do not apply to the current set of claims, (2) the prior art cited does not make a prima facie case of obviousness as all claim features are not present or inherently disclosed in the art cited, and (3) the Applicant has shown an unexpected result and solution to a long felt need.

First, both *In re Fessman* and *In re Fitzgerald* do not apply in the current situation, as the holding of the court in both instances was specific to product-by-process claims. In particular, both courts stated:

> We are therefore of the opinion that when the prior art discloses a product which reasonably appears to be either identical with or only slightly different than a product claimed in a product-by-process claim, a rejection based alternatively on either section 102 or section 103 of the statute is eminently fair and acceptable.[6]

The independent claims in the present case are clearly directed to "a film comprising polyethylene" and do not include process claim features. As stated above, the melt temperature is a measurable property of the claimed composition. For example, I_{21} is measured using a certain techniques specified in an ASTM (and in the specification as filed). This does not make claims containing such a feature a "product-by-process"

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[3] *See, e.g.*, TROUBLESHOOTING THE EXTRUSION PROCESS, page 68, (Rauwendaal and Noriega E., Hanser, 2001); POLYMER TECHNOLOGY DICTIONARY, at page 244 and 533 (Whelan, Chapman & Hall 1994) (describing "melt processing" and referencing table 7).
[4] 489 F.2d 742; 180 USPQ 324 (CCPA 1974).
[5] 619 F.2d 67; 205 USPQ 594 (CCPA 1980).
[6] *Fessman* at 744, *Fitzgerald* at 70.

claim. Such is the case presently, and thus, reliance on *In re Fessman* and *In re Fitzgerald* is erroneous.

Second, as admitted by the Examiner and pointed out above, all claim features of the independent claims are not described in the art cited by the Examiner. As one of the three basic criteria of a prima facie case of obviousness, one is that "the prior art reference (or references when combined) must teach or suggest all the claim limitations".[7] The Examiner has not established a prima facie case here.

Third, the Applicant has shown unexpected results and a solution to a long felt need. The Applicant compares three commercial polyethylenes (comparative examples) that fall outside the claim features of Applicant's invention.[8] This is surprising given the long known problems in balancing polymer properties with its ability to extrude and form a suitable end product.

Further, Applicant solves a problem long known in the art, where, until now, it was known that in large scale extruders that the polymer melt temperature must be kept relatively high and run at low speeds.[9] These relatively high melt temperatures lead to many problems, one of which is a high incidence of gels in the finished product.[10]

Indeed, Applicant's solution to the long felt needs of the industry—improving extrusion characteristics by allowing a lower melt temperature while maintaining low gel counts—is not disclosed or suggested in any of the prior art, and yet is a long recognized problem. This is also pointed out the Background section of the Applicant's invention. *Davis et al.*[11] set out to solve the problem created when HDPE is extruded by using a grooved feed extruder, but still find that

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[7] MPEP 2142.
[8] *See also* BP Solvay Polyethylene Fortiflex™ HDPE Sheet Extrusion Guide (2002).
[9] See TROUBLESHOOTING THE EXTRUSION PROCESS, page 68, (Rauwendaal and Noriega E., Hanser, 2001).
[10] *Id.* at 68, and Fig. 3.63.
[11] *Grooved Feed Single Screw Extruders—Improving Productivity and Reducing Viscous Hating Effects*, 38 (7) POLYMER ENGINEERING AND SCIENCE 1199-1204 (July 1998).

> One disadvantage of the grooved barrel extruders is the high power requirements to drive the screw. Thus, larger driving systems are necessary for their operation which together with the grooved section increase the machine cost somewhat.[12]

The present invention is unexpected because it sets out to solve this problem by improving the HDPE resin itself, with the result of an overall improvement in the power requirement as well as the capability of commercially acceptable flow rates at a desirably low melt temperature. The prior art has indeed shown that such features are not readily predictable.[13] In fact, *Guo et al.* state that "it is extremely difficult to predict melt temperature and no simple method is available at present to predict melt temperature in scale-up."[14] Note that *Rauwendaal et al.* find that melt temperature can be reliably measured for a given method of extrusion and measurement, and further that *Rasid et al.*[15] find that

> The melt temperature profiles tend to be flat in nature, the variation of melt temperature across the flow being small, typically of the order of 5°C, except where the barrel temperature in the vicinity of the sensor is significantly different from the melt temperature.[16]

Thus, one skilled in the art would know that an immersion thermocouple should be placed such that the temperature measured is in the constant or near constant value range, as was done for the compositions measured as such in the present invention. In the present case, an immersion thermocouple is used, placed as specified in the specification. When measured in such a way, as is well defined in the specification, it can be seen that the Applicant's claimed invention is an improvement over the prior art films and compositions. This improvement is represented graphically in Figures 6 and 7 of the specification as filed, where both inventive and comparative examples were extruded in the same extruder under otherwise identical conditions. The same improvement is shown in the inventive compositions/films relative to the comparative compositions even when a

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[12] Id at 1203.
[13] *See* Guo et al., *Dependence of Melt Temperature on Screw Speed and Size in Extrusion*, ANTEC 132-136 (1988).
[14] *Id.* at 135.
[15] R. Rasid and A.K. Wood in Effect of process variables on melt temperature profiles in extrusion process using single screw plastic extruder, 32 PLASTICS, RUBBER AND COMPOSITES 187-192 (May 2003).
[16] Id. at 192.

different extruder is used under different conditions than that shown in Figures 6 and 7—this improvement summarized in Table 2 and in Figures 1 and 2, where both inventive and comparative examples were extruded in the same extruder under otherwise identical conditions.

Thus, the Applicant's claimed invention is not obvious, and it is requested that these rejections be withdrawn.

It is submitted that the case is in condition for allowance. The Applicant invites the Examiner to telephone the undersigned attorney if there are any other issues outstanding which have not been presented to the Examiner's satisfaction.

Respectfully submitted,

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